



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

((A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBC 12)

DIPLOMA IN ARCHITECTURE (DA 12)

ECV 2101: CIVIL ENGINEERING MATERIALS I

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: OCTOBER 2012

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

This paper consists of **FIVE** questions. Answer question **ONE (COMPULSORY)** any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question One (20 marks)

- a) With the aid of sketch, describe the structure of the exogenous tree giving one use each part. **(9 marks)**
- b) Describe the **THREE** components of a tree giving **TWO** functions of each. **(5 marks)**
- c) Briefly describe the following engineering properties of building materials. **(6 marks)**
- i) Tensile strength
 - ii) Shear strength
 - iii) Elasticity

SECTION B (ANSWER ANY TWO QUESTIONS FROM THIS SECTION)

Question Two (20 marks)

- a) With the aid of sketches, describe the following timber conversion methods. **(6 marks)**
- i) Flat sawing
 - ii) Tangential sawing
 - iii) Rift (quarter) sawing
- b) State **THREE** properties and **THREE** uses of mild steel in Civil Engineering. **(7 marks)**
- c) With the aid of clearly labeled sketches, describe the manufacture of plywood. **(5 marks)**
- d) State **FOUR** uses of glass in building and civil engineering. **(2 marks)**

Question Three (20 marks)

- a) Explain the purpose of heat treatment in steels. **(2 marks)**
- b) Briefly describe the following heat treatment processes. **(8 marks)**
- i) Annealing
 - ii) Hardening
 - iii) Tempering
 - iv) Normalizing
- c) Outline the manufacture of glazed store wave. **(10 marks)**

Question Four (20 marks)

- a) Briefly describe the compressive strength test in stones. **(5 marks)**
- b) With the aid of a sketch, describe the permeability test in stones. **(15 marks)**

Question Five (20 marks)

- a) Briefly discuss the following properties of glass.

- i)** Density
 - ii)** Safety from injury
 - iii)** Ultra-violet transmission
 - iv)** Strength **(5 marks)**
- b)** With the aid of a sketch where applicable, explain the following timber products giving one use of each.
 - i)** Batter board
 - ii)** Hard board
 - iii)** Block board
 - iv)** Wood wool start **(10 marks)**
- c)** State **FIVE** possible processes which adhesives set. **(5 marks)**